



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,750	07/13/2001	Hiroaki Itagaki	211145US0	2048

22850 7590 06/26/2003

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER

WEINER, LAURA S

ART UNIT PAPER NUMBER

1745

DATE MAILED: 06/26/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/903,750

Applicant(s)

ITAGAKI ET AL.

Examiner

Laura S Weiner

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 17 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1745

## DETAILED ACTION

### *Election/Restriction*

1. Applicant's election with traverse of species 2, 6-di-tert-butyl-4-methylpyridine, claims 1-20 in Paper No. 7 is acknowledged. The traversal is on the ground(s) that it is not a serious burden to search all the species in the application. The examiner disagrees because R1-R5 have a page and a half of definitions that are available for R1-R5 and would be impossible to be able to search each and every combination that has been presented.

Applicant has not submitted evidence that each of the component species is not patentable distinct nor identified such evidence now of record showing the species to be obvious variants, nor admitted on the record that such is the case. Applicant's traversal is therefore not persuasive.

The requirement is still deemed proper and is therefore made FINAL.

2. No claims are withdrawn from further consideration by the examiner, 37 C.F.R. § 1.142(b), as being drawn to a non-elected species, the requirement having been traversed in Paper No. 7.

The examiner finds the species 2, 6-di-tert-butyl-4-methylpyridine allowable but found the species when R1-R5 are a hydrogen atom or an alkyl group, at least one of R1-R5 is an alkyl group having 2 or more carbon atoms and the sum of the carbon atoms of R1 to R5 is 3 or more.

Art Unit: 1745

***Claim Rejections - 35 USC § 112***

3. Claims 7-8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 is rejected because it is unclear what is meant by "wherein R1 and R5 are aforesaid substituents".

Claim 8 is rejected because it is unclear what is meant by "wherein R3 is also the aforesaid substituent".

Claim 10 is rejected because it is unclear what is meant by "calculated according to ab initio method ...the adduct between the pyridine compound and hydrofluoric acid)".

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-9, 11-13, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwakura et al. (JP 3-285271, abstract).

Art Unit: 1745

Iwakura et al. teaches a battery comprising a cathode containing Li or Li alloy, an anode containing Mo dioxide, V pentoxide, etc. and Li as anode active component and an electrolyte liquid. The electrolyte contains pyridine or pyridine derivative where R1-R5 is H or alkyl group such as diethyl pyridine, methyl ethyl pyridine, dimethyl ethyl pyridine, etc. The electrolyte contains a solvent selected from propylene carbonate, ethylene carbonate, etc. Iwakura et al. teaches on page 5, that the salts can be LiClO<sub>4</sub>, LiAsF<sub>6</sub>, LiPF<sub>6</sub>, etc.

6. Claims 1-9, 12-16, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsutsumi et al. (5,731,106).

Tsutsumi et al. teaches in column 2, lines 8-25, an electrolyte solution for a lithium secondary battery comprising an electrolyte and organic solvent and a pyridine additive where R1-R5 are the same or different, each a hydrogen atom, a lower alkyl group having 1-3 carbon atoms, a phenyl group, etc. Tsutsumi et al. teaches in column 3, lines 30-60, where the additive is a solid additive it is blended in the electrolyte solution at 0.01% by weight to its saturation level and where the additive is a liquid additive, the amount is to be blended is 0.01-5% by volume. The electrolyte comprises LiPF<sub>6</sub>, LiBF<sub>4</sub>, etc. Tsutsumi et al. teaches in column 4, lines 15-30, that the positive electrode include lithium-containing chalcogen compounds such as LiCoO<sub>2</sub>, LiNiO<sub>2</sub>, LiMnO<sub>2</sub>, etc. and the negative electrode comprises lithium and alloys.

Art Unit: 1745

7. Claims 1-9, 12-16, 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Suemori et al. (JP 7-105977, translation).

Suemori et al. teaches a battery comprising a positive electrode, a negative electrode made of a carbon-based material having a d002 of not greater than 0.37 Å and a nonaqueous electrolytic solution comprising a pyridine or derivative in an amount from 0.1 to 1% by weight. The pyridine derivative may be an alkyl pyridine having a C1-C3 alkyl group substituted for the hydrogen atom in the ortho-, meta- or para-position in pyridine. The positive electrode may be LiCoO<sub>2</sub>, LiNiO<sub>2</sub>, etc. and the electrolyte comprises LiPF<sub>6</sub>, etc.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 10 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Iwakura et al. (JP 3-285271, abstract) or Tsutsumi et al. (5,731,106) or Suemori et al. (JP 7-105977, translation).

Iwakura et al. teaches a battery comprising a cathode containing Li or Li alloy, an anode containing Mo dioxide, V pentoxide, etc. and Li as anode active component and an electrolyte

Art Unit: 1745

liquid. The electrolyte contains pyridine or pyridine derivative where R1-R5 is H or alkyl group such as diethyl pyridine, methyl ethyl pyridine, dimethyl ethyl pyridine, etc. The electrolyte contains a solvent selected from propylene carbonate, ethylene carbonate, etc. Iwakura et al. teaches on page 5, that the salts can be LiClO<sub>4</sub>, LiAsF<sub>6</sub>, LiPF<sub>6</sub>, etc.

Tsutsumi et al. teaches in column 2, lines 8-25, an electrolyte solution for a lithium secondary battery comprising an electrolyte and organic solvent and a pyridine additive where R1-R5 are the same or different, each a hydrogen atom, a lower alkyl group having 1-3 carbon atoms, a phenyl group, etc. Tsutsumi et al. teaches in column 3, lines 30-60, where the additive is a solid additive it is blended in the electrolyte solution at 0.01% by weight to its saturation level and where the additive is a liquid additive, the amount is to be blended is 0.01-5% by volume. The electrolyte comprises LiPF<sub>6</sub>, LiBF<sub>4</sub>, etc. Tsutsumi et al. teaches in column 4, lines 15-30, that the positive electrode include lithium-containing chalcogen compounds such as LiCoO<sub>2</sub>, LiNiO<sub>2</sub>, LiMnO<sub>2</sub>, etc. and the negative electrode comprises lithium and alloys.

Suemori et al. teaches a battery comprising a positive electrode, a negative electrode made of a carbon-based material having a d002 of not greater than 0.37 Å and a nonaqueous electrolytic solution comprising a pyridine or derivative in an amount from 0.1 to 1% by weight. The pyridine derivative may be an alkyl pyridine having a C1-C3 alkyl group substituted for the hydrogen atom in the ortho-, meta- or para-position in pyridine. The positive electrode may be LiCoO<sub>2</sub>, LiNiO<sub>2</sub>, etc. and the electrolyte comprises LiPF<sub>6</sub>, etc.

Art Unit: 1745

Since Iwakura et al., Tsutsumi et al. or Suemori et al. teaches the same electrolyte comprising an organic solvent, a lithium salt and the same pyridine compound then inherently the same pyridine compound exhibiting a bonding energy of 16 Kcal/mol or more with hydrofluoric acid must also be obtained.

In addition, the presently claimed property of a pyridine compound having a bonding energy of 16 Kcal/mol or more with HCL would have obviously have been present once the Iwakura et al., Tsutsumi et al. or Suemori et al. product is provided. *In re Best, 195 USPQ 433 (CCPA 1977).*

***Allowable Subject Matter***

10. Claims 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura Weiner whose telephone number is (703) 308-4396. The examiner works a flexible schedule.



Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (703) 308-2383. The fax phone number for non-after finals is 703-872-9310 and the fax phone number for after-finals is 703-872-9311.

A handwritten signature in cursive script, appearing to read 'Laura S. Weiner', written in dark ink.

Laura S. Weiner  
Primary Examiner  
Art Unit 1745  
June 23, 2003